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MEMORANDUM FOR ACS Research and Evaluation Advisory Group

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Subject: Reducing Respondent Burden in the American Community
Survey's Computer Assisted Personal Visit Interviewing Operation
– Phase 1 Results (Part 1)

Attached is the final American Community Survey Research and Evaluation report for “Reducing Respondent Burden in the American Community Survey’s Computer Assisted Personal Visit Interviewing Operation – Phase 1 Results (Part 1).” This report provides baseline information about the Computer Assisted Personal Visit Interviewing data collection including a typical month’s workload, outcomes, and contact efforts that will feed into the additional phases of the respondent burden research.

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Reducing Respondent Burden in the American Community Survey's Computer Assisted Personal Visit Interviewing Operation – Phase 1 Results (Part 1)

FINAL REPORT

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1. Introduction

There are many ways through which people communicate with each other and some people may prefer one mode over another to stay in touch with the world around them. This ability to be constantly connected can sometimes be overwhelming. Multimode surveys, such as the American Community Survey (ACS), try to find a balance between taking advantage of a variety of contact modes and strategies, and limiting respondent burden. From its inception through 2012, the ACS used a three-month sequential contact strategy to obtain responses from sampled addresses. In the first month, multiple mailings were sent to sampled addresses (i.e. pre-notice letter, paper questionnaire, reminder postcard, and, to those addresses that did not respond by a certain cut-off date, a replacement paper questionnaire). Addresses that did not provide a response by the end of the first month, and for which we had a valid phone number, were contacted using Computer-Assisted Telephone Interviewing (CATI). At the end of the second month, nonresponding addresses were subsampled and sent to Computer-Assisted Personal Interviewing (CAPI). This sequential, multimode approach can lead to a cumulative number of contacts that may be perceived by some to be harassment.

Criticism from external stakeholders about this perception of harassment provided motivation for research into the respondent burden associated with repeated contact attempts of households in the ACS interviewer-administered modes, CATI and CAPI. The research discussed in this report focuses on the CAPI mode. For results from the CATI research, see Griffin and Hughes (2013) and Zelenak and Davis (2013).

Similar to the goal of the CATI research, we want to understand the burden that repeated contact attempts in CAPI have on respondents and to identify changes that can reduce that burden without a significant cost in terms of cost and quality. The CAPI research consists of three phases. The first phase documents the current state of CAPI data collection by summarizing a typical month's workload, outcomes, and contact efforts and provides a baseline for the additional phases. This initial phase draws on case history information from previous contact attempts and outcomes from the CATI and mail modes. The second phase will use the baseline data to identify potential new data collection business rules for CAPI that we could implement in ACS production. In the third phase, we will use production data to estimate the effects of the proposed alternative business rules on respondent burden, costs, and quality. Based on these results we will recommend specific changes to existing CAPI methods and procedures. See Griffin (2013) for additional details.

2. Methodology

This report is Part 1 of a series of reports that includes baseline information from Phase 1 of the CAPI research discussed above. The information provided here will be combined with that in other reports to feed into the next phases of research including estimating a cumulative measure of burden for each sample case that we can use to baseline burden and later, measure reductions in burden. See Nelson and Griffin (2014) for additional Phase 1 baseline summaries.

The results presented here are based on ACS CAPI contact attempt and outcome status paradata from the Contact History Instrument (CHI) collected between June 2011 and February 2012. The dataset includes 437,210 completed CAPI interviews; 10,368 CAPI refusals (a type of

noninterview); 10,433 other CAPI noninterviews; and 39,606 cases determined to be ineligible for CAPI. The descriptions of these CAPI final outcomes are provided in Section 4.3.

For this analysis, we used CHI paradata, including contact attempt information, and interim and final CAPI outcome codes, to calculate workloads and contact attempt distributions. We supplemented these paradata with CATI history and CATI final status information for the cases in our universe to get an idea of the potential cumulative effect of multiple contact attempts on the final outcomes of these cases. To answer the research questions, we summarized average monthly workloads based on the nine months of CHI data from June 2011 through February 2012. References to “each month” or “an average month” in this report refer to an estimated average month, not any specific month. We divided the full dataset counts in each cell by nine to obtain the counts for an average month, therefore, some total counts may differ slightly from one table to another due to rounding. All estimates in this report are unweighted and meant to represent production workloads and efforts.

3. Limitations

- One limitation in this study is that we are working under the assumption that interviewers enter all CAPI contact attempts into the CHI. However, we are not sure that this is always the case.
- Another limitation is that we are including all types of contact attempts in this analysis, i.e. contacts with a sample household member; contacts with a person who is not a part of the sample household (apartment manager); noncontacts that were potential contacts, such as an interviewer observing the unit while passing by the sampled address; etc. We also do not differentiate between telephone call attempts and personal visit attempts during CAPI. Note that some types of these contact attempts are not necessarily burdensome to the respondent.
- A third limitation is that there is no distinction between occupied and vacant units throughout this report. Nelson and Griffin (2014) provide some detailed results separately for occupied and vacant units as well as by type of contact attempt.

4. Research Questions and Results

4.1 After CAPI subsampling, how many sample cases do we assign to CAPI each month? How does that workload break out by case histories? For example, how many sample cases were:

- a. Unmailable, not sent to CATI***
- b. Mail Nonresponse without a phone number (not sent to CATI)***
- c. Mail Nonresponse sent to CATI or Unmailable sent to CATI¹***
 - i. Determined to be ineligible for CATI (e.g., bad phone number)***
 - ii. CATI outcome of noninterview – refusal***
 - iii. CATI outcome of noninterview – reached call maximum***
 - iv. CATI outcome of noninterview – all other reasons***

¹ A small number of cases are eligible for CATI since they are in ZIP codes with high proportions of Post Office boxes and for that reason were classified as unmailable.

The case history categories listed in 4.1c above are based on ACS CATI outcomes. We used information from both the CATI history files and the CATI status files to assign cases to specific categories for this analysis. The CATI history files contain the outcome for each CATI contact made with a sample case. The CATI status files contain the final CATI status for each sample unit based on the CATI contact history. We assigned each CATI case to one of the CATI final outcome categories listed in Table 1. Note that we excluded cases that ended as interviews in CATI from this analysis because they do not feed into the CAPI workloads. Also, we excluded all cases with late mail returns from this analysis. For additional details, see Zelenak and Davis (2013).

Table 1. CATI Final Outcome Categories Feeding Into CAPI

Ineligible for CATI	<ul style="list-style-type: none"> • Sample Unit ineligible - out of scope • Never contacted - unconfirmed number
Refusal	Includes cases with a hostile breakoff, intermediate explicit refusals, implicit refusals, and/or hang-ups
Reached Call Maximum ²	Reached unproductive call maximum
Other Noninterview	<ul style="list-style-type: none"> • Sample unit eligible but unavailable through Closeout • Sample unit not found/unreached/eligibility uncertain • Congressional case (deleted) • Insufficient partial • Language barrier • Hearing barrier • Privacy Detector • Never contacted - confirmed number

Table 2 shows the estimated workload for an average month based on our data. We estimate that we sent an average of 55,000 cases to CAPI every month during this nine-month period. About half (50.1 percent) of the cases selected for CAPI were mailable but not in CATI (mail nonrespondents without an available phone number). If you add the cases sent to CATI with an invalid phone number (27.2 percent), you account for 77.3 percent of the CAPI cases. Only 11.1 percent of the CAPI workload has been through CATI, either exiting as a refusal (4.4 percent), reaching the call maximum (4.0 percent), or ending as some other type of noninterview (2.7 percent). For the 11.6 percent of CAPI cases that were unmailable and not in CATI, CAPI was their first ACS contact, so their perception of harassment in the ACS may be different from that of other CAPI cases.

² In 2011 and 2012, the CATI call maximum was 20 calls if there was no contact with the household or 25 calls if an interviewer made contact at least once with the household.

Table 2. Number of Cases in CAPI and Percent of CAPI Workload by Case History for an Average Month (Unweighted)

Case History	Number of Cases in CAPI	Percent of CAPI Workload
Unmailable (Not in CATI)	6,414	11.6
Mailable (Not in CATI)	27,685	50.1
CATI Ineligible	15,061	27.2
CATI Refusal	2,414	4.4
CATI Reached Call Maximum	2,233	4.0
CATI Other Noninterview	1,484	2.7
Total	55,291	100.0

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

4.2 What is our best estimate of the total number of CAPI contact attempts each month and the mean number of CAPI contacts per sample case? How many sample cases required a single CAPI contact versus 2, 3, ... or 10 or more contact attempts (i.e., what is the full distribution)?

In the CAPI operation, a case is assigned to an interviewer and the approach for contacting a case can be customized by the interviewer within their monthly allocation of work hours. That is, interviewers may spend more time on some cases and less on others due to any number of circumstances including travel distance and success of the contact attempts, but are encouraged to maximize their approach so as not to exceed average time spent (2.2 hours per case) and miles per case goals over their entire monthly workload. Currently, there are no rules in CAPI that limit, by day or overall, the number of contact attempts by phone or personal visit.

We estimate that interviewers made about 152,000 CAPI contact attempts either by telephone or personal visit each month to finalize or resolve³ these 55,000 cases with an average of about 2.8 contact attempts per case. In Table 3 we see that about 37.9 percent of CAPI cases were finalized on the first contact attempt and 25.8 on the second contact attempt. About 77 percent of all cases were finalized within the first three contact attempts, while about 2.8 percent required ten or more contact attempts.

³ The terms “finalize” and “resolve” are used interchangeably throughout this report to refer to the close-out of the case in the CAPI operation.

Table 3. Distribution of Total Number of CAPI Contact Attempts in an Average Month

Number of CAPI Contact Attempts	Number of CAPI Cases	Percent of CAPI Cases	Cumulative Percent of CAPI Cases	Total CAPI Contact Attempts
1	20,974	37.9	37.9	20,974
2	14,266	25.8	63.7	28,532
3	7,260	13.1	76.9	21,780
4	4,222	7.6	84.5	16,888
5	2,650	4.8	89.3	13,250
6	1,739	3.1	92.5	10,434
7	1,197	2.2	94.6	8,379
8	819	1.5	96.1	6,552
9	593	1.1	97.2	5,337
10+	1,571	2.8	100.0	20,292
Total	55,291	100.0	100.0	152,418

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

4.3 What are the CAPI outcomes each month? How many contact attempts were required, on average, by outcome? What are the distributions of total CAPI contact attempts by outcome?

There are five types of final outcomes in CAPI: Interview, Type A Refusal, Other Type A Noninterview, Type B Noninterview, and Type C Noninterview.

- a) **Interviews** include completed interviews of occupied, temporarily occupied, and vacant units, and sufficient partial interviews where interviewers were able to obtain responses to questions up to a pre-specified point in the survey.
- b) **Type A Refusals** (referred to as “Refusals” in this report) are noninterview cases where the respondent adamantly refused to provide data and refusal conversion efforts, if any, were unsuccessful.
- c) **Other Type A Noninterview** cases include noninterviews due to language problems, inability to locate the address, no one home, or residents temporarily absent.
- d) **Type B Noninterview** cases are in areas that are not accessible during the entire interview period due to a disaster and the resident is unable to be contacted by phone, possibly due to evacuation. There were only six of these cases in our nine-month dataset so we excluded them from this analysis.
- e) **Type C Noninterview** cases (referred to as “Type C Ineligibles” in this report) are determined to be ineligible for the survey. They include noninterviews due to the unit being under construction, condemned, demolished, nonexistent, or group quarters; merged with another unit; used for permanent business or storage; house/trailer moved or empty mobile home site; or address nonexistent.

From our data shown in Table 4, we estimate that about 87.9 percent of CAPI cases resulted in interviews of occupied or vacant housing units. About 8.0 percent were determined to be ineligible for the survey (Type C ineligible). The remaining 4.2 percent were other Type A noninterviews, with about half of those being refusals. CAPI cases that ended as an interview required about 2.7 contact attempts (median of 2), while refusals and other Type A noninterviews required an average of about 6.7 contact attempts (median of 6). Type C ineligible cases were identified quickly in an average of 1.7 contact attempts (median of 1).

Table 4. Average Monthly Distribution of CAPI Outcomes and Mean and Median Number of Contact Attempts by CAPI Final Outcome

CAPI Final Outcome	Number of CAPI Cases	Percent of CAPI Cases	Mean Number of CAPI Contact Attempts	Median Number of CAPI Contact Attempts
Interview	48,579	87.9	2.7	2
Refusal	1,152	2.1	6.7	6
Other Type A Noninterview	1,159	2.1	6.8	6
Type C Ineligible	4,401	8.0	1.7	1
Total	55,290	100.0	2.8	2

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

The contact attempt distributions vary by CAPI final outcome. In Table 5 we see that 21.0 percent of CAPI cases with an outcome of refusal and 22.3 percent of other Type A noninterviews required ten or more contact attempts. Only 2.2 percent of completed interviews required more than ten contact attempts. Interviewers finalized 57.3 percent of Type C ineligible cases and about 37.7 percent of all completed interviews (of which, 30.6 percent were vacant interviews) on the first contact attempt. After three attempts, they finalized 94.0 percent of all Type C ineligible cases and 77.8 percent of all interviews but only 25.3 percent of the refusals and 25.9 percent of the other Type A noninterviews.

As a reminder, this report treats all contact attempts alike. That is, contact with a member of the sample household, contact with a person not in the sample household, and non-contacts (i.e., observing the address while passing by) which may not be burdensome to the respondent are grouped together. Therefore, the distributions shown here are likely an upper bound estimate of the burden experienced by respondents. For more detailed breakouts by contact type and mode, see Nelson and Griffin (2014).

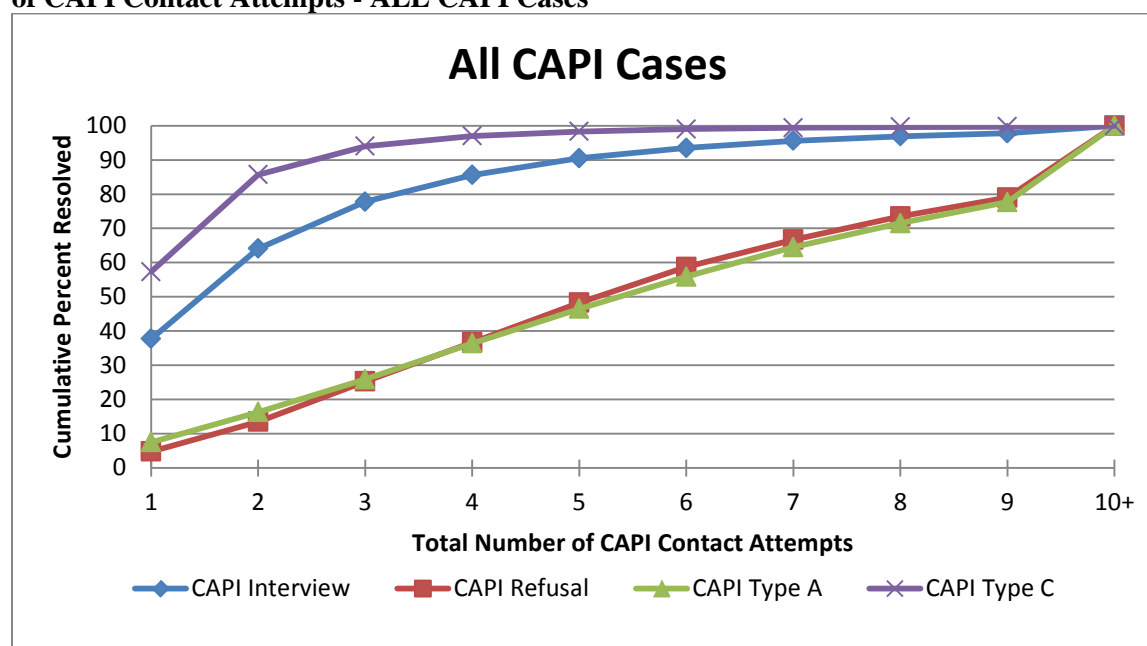
Table 5. Distribution of Total Number of CAPI Contact Attempts for Each CAPI Final Outcome - ALL CAPI Cases (Average Month)

ALL CAPI Cases (Average Month)														
	Interview			CAPI Final Outcome										
				Refusal			Other Type A Noninterview			Type C Ineligible				
Total CAPI Contact Attempts	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Total Cases	
1	18,312	37.7	37.7	55	4.8	4.8	87	7.5	7.5	2,520	57.3	57.3	20,974	
2	12,813	26.4	64.1	101	8.8	13.5	102	8.8	16.3	1,250	28.4	85.7	14,266	
3	6,649	13.7	77.8	135	11.7	25.3	111	9.6	25.9	365	8.3	94.0	7,260	
4	3,833	7.9	85.6	132	11.5	36.7	122	10.5	36.4	135	3.1	97.0	4,222	
5	2,343	4.8	90.5	133	11.5	48.3	117	10.1	46.5	57	1.3	98.3	2,650	
6	1,482	3.1	93.5	120	10.4	58.7	109	9.4	55.9	28	0.6	99.0	1,739	
7	986	2.0	95.6	92	8.0	66.7	100	8.6	64.5	19	0.4	99.4	1,197	
8	650	1.3	96.9	79	6.9	73.5	81	7.0	71.5	9	0.2	99.6	819	
9	452	0.9	97.8	63	5.5	79.0	72	6.2	77.7	6	0.1	99.7	593	
10+	1,059	2.2	100.0	242	21.0	100.0	258	22.3	100.0	12	0.3	100.0	1,571	
Total	48,579	100.0	100.0	1,152	100.0	100.0	1,159	100.0	100.0	4,401	100.0	100.0	55,291	

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

Figure 1 provides a visual display of the cumulative percent of finalized cases for each CAPI final outcome by total number of CAPI contact attempts from Table 5. Here we can see that both refusals and other Type A noninterviews have a similar, slow trend of cumulative resolution, while Type C ineligible cases were finalized fairly quickly.

Figure 1. Cumulative Percent of Cases with Each CAPI Final Outcome by Total Number of CAPI Contact Attempts - ALL CAPI Cases



Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

The next set of questions looks at the results from Questions 4.2 and 4.3 by case history (non-CATI or CATI final outcome).

4.4 What are the CAPI outcomes by case history each month?

Looking at the CAPI final outcomes by case history in Table 6, we see that, in an average month, the majority of cases ended as CAPI interviews (82.9 to 91.5 percent), no matter what case history they had. For unmailable cases that were not in CATI, the percent of CAPI interviews (82.9 percent) seemed low while the percent of Type C ineligible cases (15.2 percent) seemed high relative to the other case history categories. This is expected because CAPI is the first ACS contact attempt with those cases, thus the respondent would not have experienced burden from prior contact attempts and this is the interviewer's first opportunity to assess the status of the address.

Among CATI refusals, the percent of CAPI refusals seems high at 6.7 percent relative to the other case history categories. Further investigation into the number of contact attempts, reasons for refusal, etc. is needed to determine the cause and consider ways to reduce the number of CAPI refusals, including stopping the contact attempts earlier, especially for the CATI refusals.

Table 6. CAPI Final Outcome by Case History (Average Month)

Case History	CAPI Final Outcome								
	Interview		Refusal		Other Type A Noninterview		Type C Ineligible		Total Cases
	Num. Cases	Row %	Num. Cases	Row %	Num. Cases	Row %	Num. Cases	Row %	
Unmailable (Not in CATI)	5,319	82.9	41	0.3	78	1.2	977	15.2	6,415
Mailable (Not in CATI)	23,951	86.5	533	1.9	591	2.1	2,610	9.4	27,685
CATI Ineligible	13,763	91.4	293	1.9	307	2.0	698	4.6	15,061
CATI Refusal	2,149	89.0	161	6.7	69	2.9	36	1.5	2,415
CATI Reached Call Max	2,043	91.5	73	3.3	68	3.0	49	2.2	2,233
CATI Other Noninterview	1,355	91.3	50	3.4	47	3.2	32	2.2	1,484
Total	48,580	87.9	1,151	2.1	1,160	2.1	4,402	8.0	55,293

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

4.5 Are there certain CATI outcomes that have higher rates of CAPI noninterviews?

Yes. In Table 6, while about 2.1 percent of all CAPI cases ended as refusals (a type of noninterview), about 6.7 percent of the cases that were CATI refusals, 3.3 percent of the cases that reached the CATI call maximum, and 3.4 percent of CATI other noninterviews were CAPI refusals. The rate for unmailables not in CATI was 0.3 percent. About three percent of CATI refusals, other noninterviews and those that reached CATI call maximum were CAPI other Type A noninterviews (due to language problems or temporarily absent residents). About two percent of CATI ineligible and mailables not in CATI were CAPI other Type A noninterviews.

Type C ineligible have very different distributions across case history. About 15.2 percent of unmailables not in CATI, 9.4 percent of mailable cases not in CATI, and 4.6 percent of CATI ineligible ended as CAPI Type C ineligible. Cases with the other types of CATI history, refusal, other noninterview, or reached the call maximum, were less likely to be Type C ineligible (1.5, 2.2 and 2.2 percent, respectively) which makes sense if we had a working phone number.

4.6 By case history, what is our best estimate of the total number of CAPI contact attempts each month and the mean number of CAPI contacts per sample case? Which CATI outcomes require the greatest CAPI effort to resolve?

When we look at the total contact attempts on average per month by case history, the case workload distributions seem to drive the number of total contact attempts. Table 7 shows that interviewers made about 77,000 contact attempts (50.4 percent) with addresses that were mailable and did not go to CATI and another 43,000 contact attempts (28.3 percent) were for cases that were sent to CATI but were determined to be ineligible for CATI due to an invalid phone number. The unmailable cases not in CATI, despite being 11.6 percent of the workload, only required about 8.3 percent of the contact attempts because they turned into Type C ineligible at a higher rate (seen in Table 6) and only took one or two contact attempts. Contact attempts for mailable cases not in CATI and CATI ineligible cases made up about the same

percentage of the total contact attempts as their respective percentage of cases. By case history, the mean number of contact attempts per case ranged from 2.0 for unmailables not in CATI to over three for the three types of CATI noninterviews (refusal, reached call max, and other noninterview). In general, cases with a working phone number saw a higher average number of CAPI contact attempts.

Table 7. CAPI Case Workload and Total Number of Contact Attempts by Case History (Average Month)

Case History	Total Number of CAPI Cases ⁴	Percent of CAPI Cases	Total Number of CAPI Contact Attempts	Percent of CAPI Contact Attempts	Mean Number of Contact Attempts Per Case
Unmailable (Not in CATI)	6,409	11.6	12,716	8.3	2.0
Mailable (Not in CATI)	27,670	50.1	77,016	50.4	2.8
CATI Ineligible	15,055	27.2	43,161	28.3	2.9
CATI Refusal	2,409	4.4	7,583	5.0	3.1
CATI Reached Call Max	2,222	4.0	7,439	4.9	3.3
CATI Other Noninterview	1,485	2.7	4,795	3.1	3.2
Total	55,250	100.0	152,710	100.0	2.8

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

If we look within CAPI outcome in Table 8, we see some variability of the mean and median number of CAPI contact attempts by case history. For example, while completed CAPI interviews required an average of 2.7 contact attempts, cases that were CATI noninterviews due to reaching the call maximum required about 3.1 contact attempts on average and unmailables not in CATI only required an average of 2.0 attempts to end as an interview. Among CAPI refusals, while overall CAPI refusals required an average of 6.7 contact attempts, cases that reached the CATI call maximum required 7.5 attempts on average to end as a CAPI refusal; unmailables not in CATI and refusals in CATI required 5.1 and 5.6 average contact attempts, respectively.

Cases with a final CAPI Type A noninterview status, which includes “no one home,” had some of the highest mean number of contact attempts with cases that reached the CATI call maximum and CATI other noninterviews requiring about 8.0 and 7.6 contact attempts, respectively. In this category, however, unmailables not in CATI had a low mean number of contact attempts (3.5) which may be because they are in more rural areas and the costs to reach them led to the decision to stop contact attempts sooner.

⁴ Note that the totals in this column are slightly different from those shown in Table 2 due to rounding.

Table 8. Mean and Median Number of CAPI Contact Attempts by Case History

Case History	CAPI Final Outcome							
	Interview		Refusal		Other Type A Noninterview		Type C Ineligible	
	Mean Number of CAPI Contact Attempts	Median Number of CAPI Contact Attempts	Mean Number of CAPI Contact Attempts	Median Number of CAPI Contact Attempts	Mean Number of CAPI Contact Attempts	Median Number of CAPI Contact Attempts	Mean Number of CAPI Contact Attempts	Median Number of CAPI Contact Attempts
Unmailable (Not in CATI)	2.0	1	5.1	4	3.5	3	1.6	1
Mailable (Not in CATI)	2.7	2	6.8	6	6.9	6	1.7	1
CATI Ineligible	2.7	2	7.1	6	7.1	6	1.8	1
CATI Refusal	2.9	2	5.6	5	6.5	5	2.0	1
CATI Call Max	3.1	2	7.5	6	8.0	7	1.9	1
CATI Other Noninterview	3.0	2	6.6	6	7.6	6	1.9	1
All CAPI Cases	2.7	2	6.7	6	6.8	6	1.7	1

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

4.7 By case history, how many sample cases required a single CAPI contact versus 2, 3, ... or 10 or more contact attempts (i.e., what is the full distribution)?

Tables 9 through 14 show the distribution of total contact attempts by CAPI outcome for each type of case history (non-CATI or CATI final outcome) separately. For a visual view of these tables, Figures 2 through 7 show the cumulative percent of cases with each CAPI final outcome by total number of CAPI contact attempts separately for each case history.

In general, we note that cases are either finalized in a few contact attempts or contact continues until the month ends. Generally, CAPI interviews and Type C ineligible cases are finalized in fewer total contact attempts on average compared to CAPI refusals and other Type A noninterviews. A brief summary of the highlights from these tables and figures is provided after Figure 7.

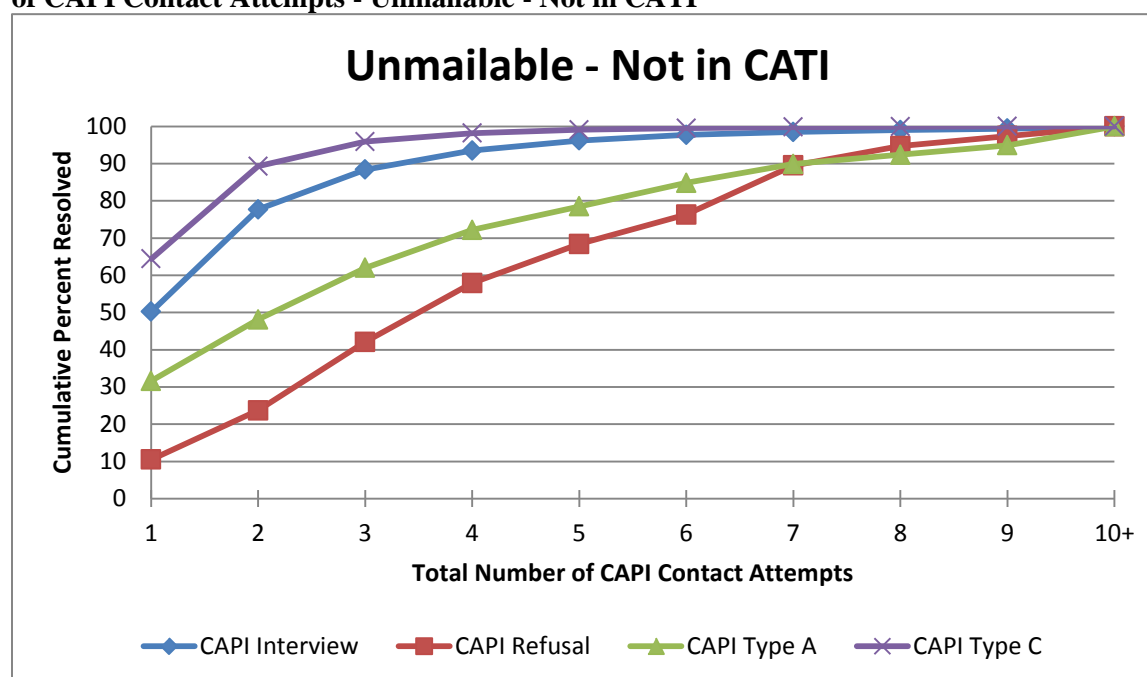
For unmailable cases not in CATI, CAPI is the first ACS contact. Table 9 shows that 50.2 percent of interviews and 64.4 percent of Type C ineligible cases were finalized in one contact attempt. While 93.5 percent of interviews and 98.2 percent of Type C ineligible cases were finalized in one to four contact attempts, it took up to seven contact attempts to finalize about 90 percent of refusals and other Type A noninterview cases. We note, however, that very few cases (less than 2 percent of unmailables not in CATI) ended as CAPI refusals or other Type A noninterviews.

Table 9. Distribution of Total Number of CAPI Contact Attempts for Each CAPI Final Outcome - Unmailable - Not in CATI (Average Month)

Unmanageable - Not in CAPI (Average Monthly)														
	Interview			Refusal			Other Type A Noninterview			Type C Ineligible				
Total CAPI Contact Attempts	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Total Cases	
1	2,671	50.2	50.2	4	10.5	10.5	25	31.6	31.6	628	64.4	64.4	3,328	
2	1,459	27.4	77.7	5	13.2	23.7	13	16.5	48.1	243	24.9	89.3	1,720	
3	568	10.7	88.4	7	18.4	42.1	11	13.9	62.0	64	6.6	95.9	650	
4	273	5.1	93.5	6	15.8	57.9	8	10.1	72.2	22	2.3	98.2	309	
5	142	2.7	96.2	4	10.5	68.4	5	6.3	78.5	9	0.9	99.1	160	
6	80	1.5	97.7	3	7.9	76.3	5	6.3	84.8	4	0.4	99.5	92	
7	44	0.8	98.5	5	13.2	89.5	4	5.1	89.9	3	0.3	99.8	56	
8	28	0.5	99.0	2	5.3	94.7	2	2.5	92.4	1	0.1	99.9	33	
9	18	0.3	99.4	1	2.6	97.4	2	2.5	94.9	1	0.1	100.0	22	
10+	34	0.6	100.0	1	2.6	100.0	4	5.1	100.0	0	0.0	100.0	39	
Total	5,317	100.0	100.0	38	100.0	100.0	79	100.0	100.0	975	100.0	100.0	6,409	

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

Figure 2. Cumulative Percent of Cases with Each CAPI Final Outcome by Total Number of CAPI Contact Attempts - Unmailable - Not in CATI



Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

In Table 10 and Figure 3, mailable cases not in CATI that ended as CAPI refusals or other Type A noninterviews show similar slow trends of resolution at each number of contact attempts with about 22 percent of cases with each of these outcomes needing ten or more contact attempts. In

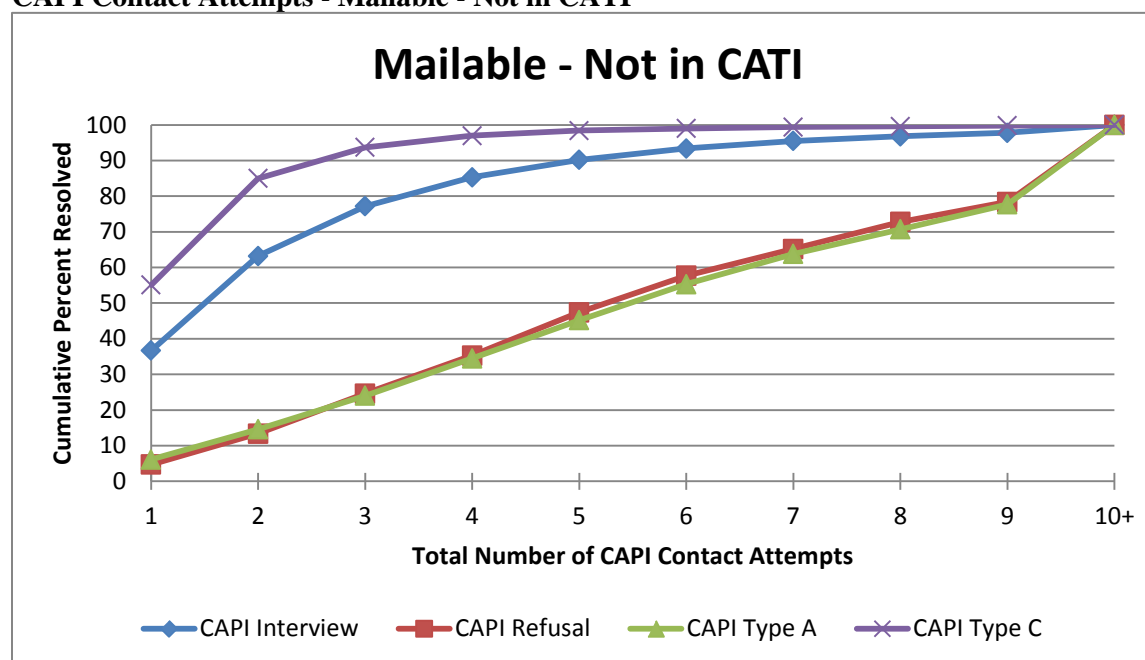
contrast, about 90 percent of interviews took one to five contact attempts while about 94 percent of Type C ineligible cases were finalized in one to three contact attempts.

Table 10. Distribution of Total Number of CAPI Contact Attempts for Each CAPI Final Outcome - Mailable - Not in CATI (Average Month)

Available	Not in CAPI (Average Monthly)												
	CAPI Final Outcome												
	Interview			Refusal			Other Type A Noninterview			Type C Ineligible			
Total CAPI Contact Attempts	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Total Cases
1	8,791	36.7	36.7	25	4.7	4.7	36	6.1	6.1	1,437	55.1	55.1	10,289
2	6,346	26.5	63.2	46	8.7	13.4	50	8.5	14.6	778	29.8	85.0	7,220
3	3,349	14.0	77.2	59	11.2	24.6	55	9.4	24.0	229	8.8	93.7	3,692
4	1,932	8.1	85.3	57	10.8	35.3	62	10.5	34.5	85	3.3	97.0	2,136
5	1,186	5.0	90.2	64	12.1	47.4	63	10.7	45.2	35	1.3	98.4	1,348
6	752	3.1	93.4	54	10.2	57.7	59	10.0	55.3	17	0.7	99.0	882
7	503	2.1	95.5	40	7.6	65.2	50	8.5	63.8	11	0.4	99.4	604
8	331	1.4	96.8	40	7.6	72.8	41	7.0	70.7	5	0.2	99.6	417
9	228	1.0	97.8	30	5.7	78.4	41	7.0	77.7	4	0.2	99.8	303
10+	528	2.2	100.0	114	21.6	100.0	131	22.3	100.0	6	0.2	100.0	779
Total	23,946	100.0	100.0	529	100.0	100.0	588	100.0	100.0	2,607	100.0	100.0	27,670

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

Figure 3. Cumulative Percent of Cases with Each CAPI Final Outcome by Total Number of CAPI Contact Attempts - Mailable - Not in CATI



Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

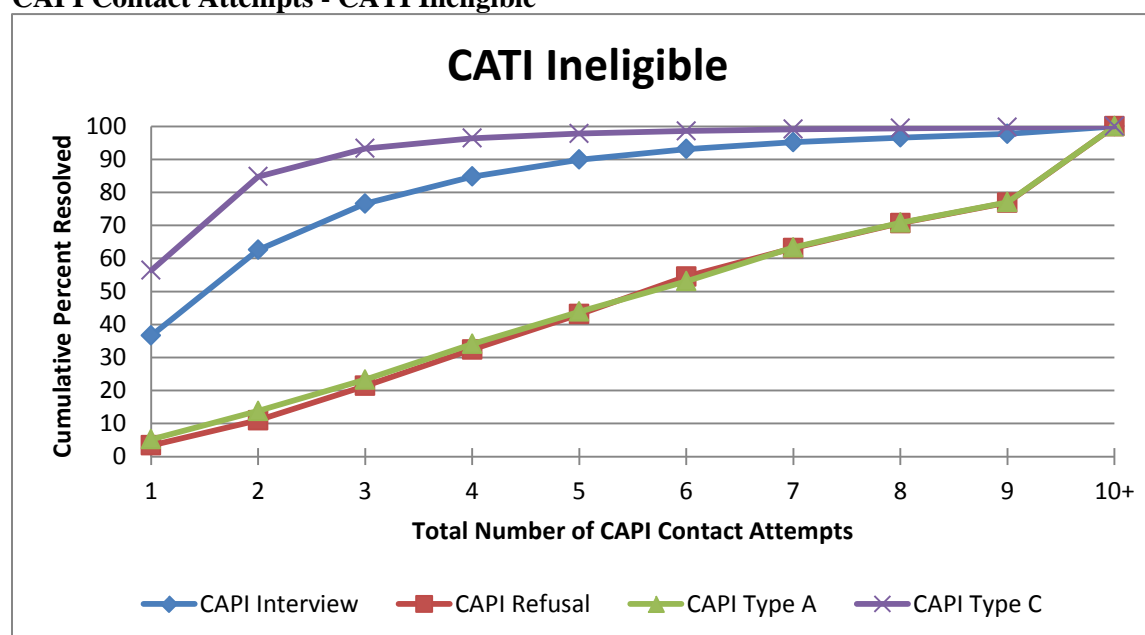
CATI cases that were determined to be ineligible because of a non-valid phone number had a similar trend of resolution in CAPI as the mailable cases not in CATI. Table 11 shows that about 90 percent of CAPI interviews were finalized in one to five contact attempts, while 93.3 percent of Type C ineligible cases were finalized in one to three attempts.

Table 11. Distribution of Total Number of CAPI Contact Attempts for Each CAPI Final Outcome - CATI Ineligible (Average Month)

Total CAPI Contact Attempts	Interview			Refusal			Other Type A Noninterview			Type C Ineligible			Total Cases
	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	
1	5,036	36.6	36.6	10	3.4	3.4	16	5.2	5.2	393	56.4	56.4	5,455
2	3,582	26.0	62.6	22	7.6	11.0	26	8.5	13.8	198	28.4	84.8	3,828
3	1,927	14.0	76.6	30	10.3	21.4	29	9.5	23.3	59	8.5	93.3	2,045
4	1,128	8.2	84.8	32	11.0	32.4	33	10.8	34.1	22	3.2	96.4	1,215
5	696	5.1	89.9	31	10.7	43.1	30	9.8	43.9	10	1.4	97.8	767
6	441	3.2	93.1	33	11.4	54.5	28	9.2	53.1	5	0.7	98.6	507
7	294	2.1	95.2	25	8.6	63.1	31	10.2	63.3	4	0.6	99.1	354
8	197	1.4	96.6	22	7.6	70.7	23	7.5	70.8	2	0.3	99.4	244
9	142	1.0	97.7	18	6.2	76.9	19	6.2	77.0	2	0.3	99.7	181
10+	320	2.3	100.0	67	23.1	100.0	70	23.0	100.0	2	0.3	100.0	459
Total	13,763	100.0	100.0	290	100.0	100.0	305	100.0	100.0	697	100.0	100.0	15,055

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

Figure 4. Cumulative Percent of Cases with Each CAPI Final Outcome by Total Number of CAPI Contact Attempts - CATI Ineligible



Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

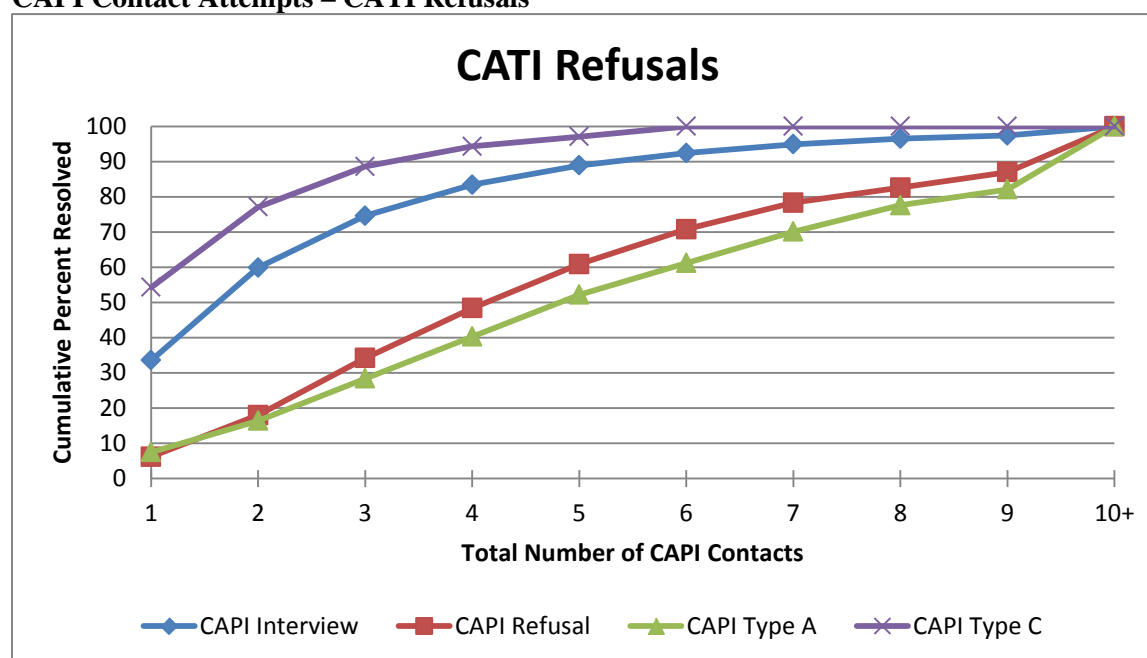
Table 12 shows that 89 percent of CATI refusals that ended as CAPI interviews were finalized in one to five contact attempts, while most Type C ineligible cases needed one to six contact attempts. CAPI refusals and other Type A noninterviews took longer to finalize with 13 percent and 18 percent, respectively, needing ten or more contact attempts.

Table 12. Distribution of Total Number of CAPI Contact Attempts for Each CAPI Final Outcome - CATI Refusals¹ (Average Month)

Total CAPI Contact Attempts	Interview			Refusal			Other Type A Noninterview			Type C Ineligible			Total Cases
	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	
1	721	33.6	33.6	10	6.2	6.2	5	7.5	7.5	19	54.3	54.3	755
2	565	26.3	59.9	19	11.8	18.0	6	9.0	16.4	8	22.9	77.1	598
3	315	14.7	74.6	26	16.1	34.2	8	11.9	28.4	4	11.4	88.6	353
4	189	8.8	83.4	23	14.3	48.4	8	11.9	40.3	2	5.7	94.3	222
5	118	5.5	88.9	20	12.4	60.9	8	11.9	52.2	1	2.9	97.1	147
6	75	3.5	92.4	16	9.9	70.8	6	9.0	61.2	1	2.9	100.0	98
7	54	2.5	94.9	12	7.5	78.3	6	9.0	70.1	0	0.0	100.0	72
8	34	1.6	96.5	7	4.3	82.6	5	7.5	77.6	0	0.0	100.0	46
9	19	0.9	97.4	7	4.3	87.0	3	4.5	82.1	0	0.0	100.0	29
10+	56	2.6	100.0	21	13.0	100.0	12	17.9	100.0	0	0.0	100.0	89
Total	2,146	100.0	100.0	161	100.0	100.0	67	100.0	100.0	35	100.0	100.0	2,409

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

Figure 5. Cumulative Percent of Cases with Each CAPI Final Outcome by Total Number of CAPI Contact Attempts – CATI Refusals



Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

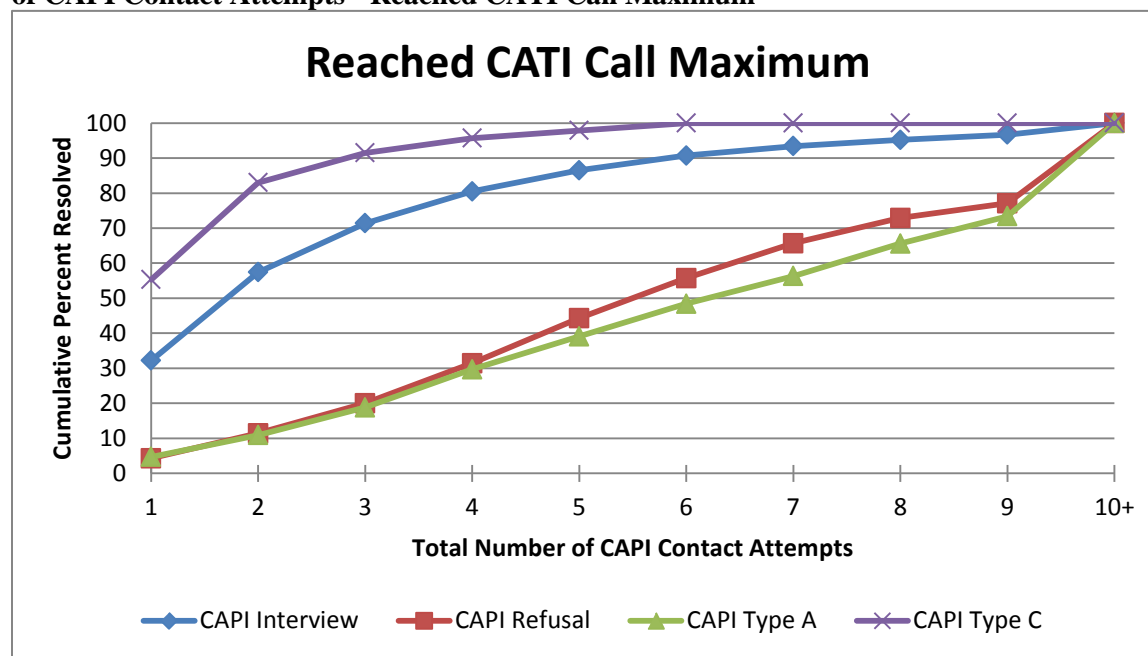
Table 13 shows that, for cases that reached the CATI call maximum, CAPI other Type A noninterviews and CAPI refusals tended to take more time to finalize than interviews and Type C ineligible with 22.9 and 26.6 percent, respectively, needing ten or more contact attempts.

Table 13. Distribution of Total Number of CAPI Contact Attempts for Each CAPI Final Outcome - Reached CATI Call Maximum (Average Month)

	CAPI Final Outcome												
	Interview			Refusal			Other Type A Noninterview			Type C Ineligible			
Total CAPI Contact Attempts	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Total Cases
1	657	32.2	32.2	3	4.3	4.3	3	4.7	4.7	26	55.3	55.3	689
2	514	25.2	57.4	5	7.1	11.4	4	6.3	10.9	13	27.7	83.0	536
3	287	14.1	71.4	6	8.6	20.0	5	7.8	18.8	4	8.5	91.5	302
4	186	9.1	80.5	8	11.4	31.4	7	10.9	29.7	2	4.3	95.7	203
5	122	6.0	86.5	9	12.9	44.3	6	9.4	39.1	1	2.1	97.9	138
6	85	4.2	90.7	8	11.4	55.7	6	9.4	48.4	1	2.1	100.0	100
7	56	2.7	93.4	7	10.0	65.7	5	7.8	56.3	0	0.0	100.0	68
8	36	1.8	95.2	5	7.1	72.9	6	9.4	65.6	0	0.0	100.0	47
9	30	1.5	96.7	3	4.3	77.1	5	7.8	73.4	0	0.0	100.0	38
10+	68	3.3	100.0	16	22.9	100.0	17	26.6	100.0	0	0.0	100.0	101
Total	2,041	100.0	100.0	70	100.0	100.0	64	100.0	100.0	47	100.0	100.0	2,222

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

Figure 6. Cumulative Percent of Cases with Each CAPI Final Outcome by Total Number of CAPI Contact Attempts - Reached CATI Call Maximum



Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

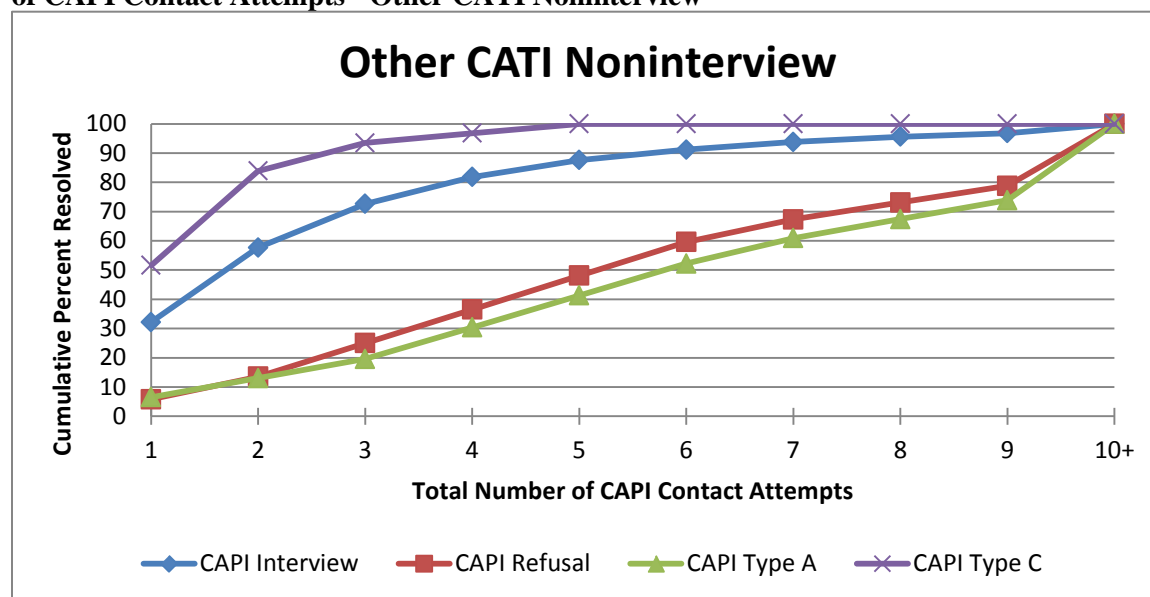
Other CATI noninterviews had similar resolution trends as for other groups. Half of the Type C ineligible cases and about one-third of the CAPI interviews were finalized in one contact attempt. About 21 percent of CAPI refusals and 26 percent of other Type A noninterviews needed ten or more contact attempts.

Table 14. Distribution of Total Number of CAPI Contact Attempts for Each CAPI Final Outcome - Other CATI Noninterview (Average Month)

Total CAPI Contact Attempts	Interview			Refusal			Other Type A Noninterview			Type C Ineligible			Total Cases
	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	Num. Cases	Col. %	Cuml. %	
1	436	32.2	32.2	3	5.8	5.8	3	6.5	6.5	16	51.6	51.6	458
2	346	25.5	57.7	4	7.7	13.5	3	6.5	13.0	10	32.3	83.9	363
3	203	15.0	72.6	6	11.5	25.0	3	6.5	19.6	3	9.7	93.5	215
4	124	9.1	81.8	6	11.5	36.5	5	10.9	30.4	1	3.2	96.8	136
5	79	5.8	87.6	6	11.5	48.1	5	10.9	41.3	1	3.2	100.0	91
6	49	3.6	91.2	6	11.5	59.6	5	10.9	52.2	0	0.0	100.0	60
7	35	2.6	93.8	4	7.7	67.3	4	8.7	60.9	0	0.0	100.0	43
8	25	1.8	95.6	3	5.8	73.1	3	6.5	67.4	0	0.0	100.0	31
9	16	1.2	96.8	3	5.8	78.8	3	6.5	73.9	0	0.0	100.0	22
10+	43	3.2	100.0	11	21.2	100.0	12	26.1	100.0	0	0.0	100.0	66
Total	1,356	100.0	100.0	52	100.0	100.0	46	100.0	100.0	31	100.0	100.0	1,485

Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

Figure 7. Cumulative Percent of Cases with Each CAPI Final Outcome by Total Number of CAPI Contact Attempts - Other CATI Noninterview



Source: U.S. Census Bureau, American Community Survey Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012 Production Data

Overall, Figures 2 through 7 show that, independent of the case history, CAPI interviews and Type C ineligible cases tend to be resolved more quickly than CAPI refusals and other Type A noninterviews. In Tables 9 through 14, we see that for all case histories, except the unmailables not in CATI, about one-third of the CAPI interviews (32.2 to 36.7 percent) and about half of Type C ineligible cases (51.6 to 56.4 percent) were resolved in one contact attempt. The unmailables not in CATI saw higher percentages of resolution (50.2 percent and 64.4 percent, respectively) for these CAPI final outcomes at the first contact attempt most likely because CAPI is the first ACS contact with the address. Respondents have not been burdened by repeated contacts and this is the first opportunity for interviewers to physically assess the status of an address.

By contact history, except for CATI refusals and unmailables not in CATI, 21.2 to 26.6 percent of CAPI refusals and other Type A noninterviews needed ten or more contact attempts. Both CATI refusals and unmailables not in CATI that ended as CAPI refusals or other Type A noninterviews saw a smaller percentage of cases needing ten or more contacts (CATI refusals: 13.0 and 17.9 percent, respectively; unmailables: 2.6 and 5.1 percent, respectively). For CATI refusals, this could be an indication of respondents refusing due to the burden of being contacted in multiple modes. As noted earlier, additional research should be done to investigate the CATI refusals that ended as CAPI refusals to determine if anything can be done to encourage them to respond.

Mailable cases not in CATI and CATI ineligible cases showed similar trends of resolution in CAPI (Tables 10-11 and Figures 3-4) which is likely attributed to the similarity of their contact history: both were nonrespondents during the mail operation and neither were contacted by telephone in the CATI operation.

5. Conclusion

Using the June 2011 through February 2012 ACS CHI data, we found an average monthly CAPI case workload of about 55,000 sample addresses. CAPI interviewers made approximately 152,000 contact attempts to complete these cases. While the overall average number of contact attempts per case is about 2.8, when we look at the different types of CAPI outcomes, we see that CAPI refusals and other Type A noninterviews generally tend to take more contact attempts to complete than CAPI interviews and Type C ineligible cases. Further analysis of the specific types of actual contact with these cases should be used to inform the development of revised contact strategies. One possible way to reduce perceived burden on these cases and reduce costs is to set a limit on the number of CAPI contact attempts or actual contacts per case. While this may decrease the number of completed interviews, the money saved could be used to add more sample cases to the CAPI workload and possibly result in more interviews overall. There is, however, an underlying concern that the cases that require more contacts or contact attempts have different characteristics than those contacted in fewer attempts. Continued research into the demographics and associated data for these cases is recommended.

Another suggestion is to use the CATI final outcome as an indicator for how many contacts should be attempted with a particular address. While the CATI outcome did not necessarily predict the outcome of the CAPI operation, we did see that a greater number of CAPI contact attempts were needed for CATI cases to end as CAPI refusals compared to interviews, suggesting that the added effort by CAPI interviewers for these cases may not be warranted.

6. References

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